UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,765	02/12/2002	Ashish Banerji	PD-201157	9961

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/074,765	BANERJI ET AL.
	Examiner	Art Unit	
	Tung Vo	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>03</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>04/28/2009</u>.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-23</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) <u>1-23</u> is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All b) ☐ Some * c) ☐ None of:
        1. ☐ Certified copies of the priority documents have been received.
        2. ☐ Certified copies of the priority documents have been received in Application No. _____.
        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

U.S. Patent and Trademark Office
PTOL-326 (Rev. 7-05)   Office Action Summary   Part of Paper No./Mail Date 20090730

DETAILED ACTION

Response to Decision by the BPAI

1.   The previous rejections of claims 1-23 have been reversed by the Board of Patent

Appeals and Interferences on 04/28/2009, therefore, prosecution of the above claims is reopened.

A rejection for the claims on new grounds follows below.

Claim Rejections - 35 USC § 101

2.   The specification defines a "computer-readable medium", as used herein [0051] that

refers communicate digital data with computer system 600, are exemplary forms of carrier waves

bearing the information and instructions,[0052] that refers computer system 600 may obtain

application code in the form of a carrier wave, [0053] that refers any other memory chip or

cartridge, a carrier wave.

3.   The invention claims "a computer-readable medium" as specified in claim 16 that is

directed non-statutory subject matter as a carrier wave. Therefore, claim 16 is rejected under 35

U.S.C. 101.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 1-2 and 11-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Savatier (US 5,400,075).

Re claim 1, Savatier discloses a method of compressing video (fig. 1), comprising:

grouping video frames (GOFi and GOFi+1 of fig. 1, grouping the video stream into groups of pictures as GOFs) that are only between consecutive I-frames (I of GOFi and I of GOFi+1 of fig. 1) into a video data set (IBBPBBPBB frames of fig. 1; col. 2, lines 44-53);

splitting (dividing) the video data set into a plurality of homogeneous files (note dividing the video dated set into Slice 1-Slice n, MB1-MBr, and Y1-Y4 and U and V; fig. 1, col. 2, lines 53-60, Y1-Y4 is considered as homogeneous files); and

individually compressing each of the homogeneous files (col. 2, lines 60-62, the luminance and chrominance information are homogeneous files because they have uniform or same properties such as Y1-Y4, U, and V of fig. 1; and the luminance and chrominance are coded separately).

Re claim 2, Savatier further discloses wherein the video frames include P-frames and B-frames (B and P frames within the GOF, fig. 1).

Re claim 11, Savatier further discloses wherein said compressing includes bit plane encoding quantized transform coefficients obtained from the video data set (9-11 of fig. 1).

Re claim 12, Savatier further discloses wherein said compressing includes performing a run-length encoding of bit planed encoded coefficients (8 and 11 of fig. 1).

Re claim 13, Savatier further discloses wherein said homogeneous files have similar statistical properties (e.g. Y1-Y4 of fig. 1).

Re claim 14, Savatier further discloses further comprising multiplexing the separate files into a bit stream (col. 2, lines 60-62).

Re claim 15, Savatier further discloses comprising prefixing a corresponding header to each of the separate files, said header indicating a size of a corresponding separate file (col. 3, lines 46-53).

Re claim 16, Savatier further discloses a computer-readable medium bearing Instructions for compressing video, said instructions being arranged, upon execution by one or more processors, to perform the steps of the methods as in any of claims 1, 2, 11-15 (fig. 1, col. 4, lines 3-8; note the VLC is a memory programmed at respective address locations with variable length codewords corresponding to the address values, this indicates the VLC is programmable to encode the video data, it is further noted that an MPEG like video signal compression system inherently has computer programmable instructions to execute the compression/decompression processes, see flowcharts in figures 5-7).

Re claim 17, Savatier discloses a video compression system (fig. 1), comprising:

means (fig. 1) for grouping video frames (GPFi and GOFi+1 of fig. 1) that are only between consecutive I-frames (I of GOFi and I of GOFi+1 of fig. 1) into a video data set (IBBPBBPBB frames of fig. 1; col. 2, lines 44-53);

means (fig. 1) splitting (dividing) the video data set into a plurality of homogeneous files (Slice 1-Slice n, MB1-MBr, and Y1-Y4 and U and V of fig. 1, col. 2, lines 53-60); and

means (10 of fig. 1) individually compressing each of the homogeneous files (col. 2, lines

60-62, the luminance and chrominance information are homogeneous files because they have

uniform or same properties such as Y1-Y4, U, and V of fig. 1, and the luminance and

chrominance are coded separately).

Re claim 18, Savatier further discloses means (10 and 12 of fig. 1) for multiplexing the

individually compressed files into a bit stream (col. 2, lines 60-62).

Re claims 19-20, see analysis in claims 1 and 2;

Re claim 21, see analysis in claim 1;

Re claims 22-23 see analysis in claims 1 and 14.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2.   Claims 3, 5, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Savatier (US 5,400,075) in view of Tahara et al. (US 5,805,225).

Re claims 3, 5, Savatier does not particularly disclose storing mode information of the

video data set and motion components in separate files; and storing B-frame components of the

video data set and P-frame components of the video data set in separate files as claimed.

Tahara teaches storing mode information of the video data set and motion components in separate files and B-frame components of the video data set and P-frame components of the video data set in separate files (51a, 51b, 51c, and 51 of fig. 6).

Taking the teachings of Savatier and Tahara as a whole, it would have been obvious to one of ordinary skill in the art to modify the teachings of Savatier into the encoder of Savatier for improving encoding and decoding efficiency.

Re claims 16/3 and 16/5, Savatier further discloses a computer-readable medium bearing Instructions for compressing video, said instructions being arranged, upon execution by one or more processors, to perform .the steps of the methods (fig. 1, col. 4, lines 3-8; note the VLC is a memory programmed at respective address locations with variable length codewords corresponding to the address values, this indicates the VLC is programmable to encode the video data, it is further noted that an MPEG like video signal compression system inherently has computer programmable instructions to execute the compression/decompression processes, see flowcharts in figures 5-7).

3.   Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savatier (US 5,400,075) in view of Carnahan (US 5,414,780).

Re claims 4 and 16, Savatier teaches splitting video data into the B components and P components but not include storing mode information of the video data set and motion components that includes storing horizontal components of the video data set and vertical components of the video data set in separate files as claimed.

However, Carnahan teaches storing mode information of the video data set (horizontal and vertical vectors) and motion components NxM horizontal and vertical image data block include vectors) that include storing horizontal components of the video data set and vertical components of the video data set in separate files (col. 3, line 49-col. 4, line 3) and performing a run-length encoding of bit planed encoded coefficients (col. 11 and 12, note TRANSFORMER (52), QUANTIZER (54), and CODER (56) performs transforming, quantizing and nm-length coding the video data set).

Therefore, taking the teachings of Savatier and Carnahan as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the step of storing the mode information and motion components into the separate files (memories) and the transformer, quantize and coder of Carnahan into the encoder of Savatier for the same purpose of run-length coding the transformed, quantized video data set that retrieves from the separate files.

Doing so would provide the quantization process reduces the magnitude or number of bits of each quantized word and the coder circuit to implement coding in an efficient manner.

Re claim 16/4, Savatier further discloses a computer-readable medium bearing Instructions for compressing video, said instructions being arranged, upon execution by one or more processors, to perform .the steps of the methods (fig. 1, col. 4, lines 3-8; note the VLC is a memory programmed at respective address locations with variable length codewords corresponding to the address values, this indicates the VLC is programmable to encode the video data, it is further noted that an MPEG like video signal compression system inherently has computer programmable instructions to execute the compression/decompression processes, see flowcharts in figures 5-7).

4.   Claims 6, 7, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Savatier (US 5,400,075) in view of to claim 1 and in view of Kato et al. (US 5,719,986).

Re clam Claims 6, 7, and 16, Savatier teaches the encoder for encoding the video

sequence into the MPEG compliant transport stream using predicted frame information but not

include storing mode 3 B- frame components of the video data set and mode 0, 1, and 2 B-frame

components of the video data set in separate files and different color components of the video

data set in different files as claimed.

However, Kato teaches storing mode 3 B- frame components of the video data set (61 of

fig. 3, note intra prediction for B-frame and mode 0, 1, and 2 B-frame components (14, 23 of fig.

3, note forward prediction, backward prediction, and bi-directional prediction) of the video data

set in separate files and storing different color components of the video data set in different files

(12 of fig. 3, see also fig. 5C, note Y, Cb and Cr are different color components).

Taking the teachings of Savatier and Kato as a whole, it would have been obvious to one

of ordinary skill in the art to incorporate the teachings intra-prediction mode for B- frame having

forward, backward, and bi-directional prediction of Kato into the encoder of Savatier to improve

efficiency of encoding. Doing so would provide to a decoder a higher quality image.

Re claims 16/6 and 16/7, Savatier further discloses a computer-readable medium bearing

Instructions for compressing video, said instructions being arranged, upon execution by one or

more processors, to perform .the steps of the methods (fig. 1, col. 4, lines 3-8; note the VLC is a

memory programmed at respective address locations with variable length codewords

corresponding to the address values, this indicates the VLC is programmable to encode the video

data, it is further noted that an MPEG like video signal compression system inherently has

computer programmable instructions to execute the compression/decompression processes, see flowcharts in figures 5-7).

5.   Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savatier (US 5,400,075) in view of Weinberger et al (US 5,680,129).

Re claims 8 and 16, Savatier fails particularly teach mapping negative values in one of the homogeneous files into positive values, and file header as claimed.

However, Weinberger teaches mapping negative values in one of the homogeneous files into positive values (col. 15, lines 59-64), and file header.

Therefore, taking the teachings of Savatier and Weinberger as a whole, it would have been obvious to one of ordinary skill in the art to modify the technique of mapping negative values into one of homogeneous files into positive values into the encoder of Savatier to improve performance of encoding color image. Doing so would result in a more efficient compression of the image.

Re claim 16/8, Savatier further discloses a computer-readable medium bearing Instructions for compressing video, said instructions being arranged, upon execution by one or more processors, to perform .the steps of the methods (fig. 1, col. 4, lines 3-8; note the VLC is a memory programmed at respective address locations with variable length codewords corresponding to the address values, this indicates the VLC is programmable to encode the video data, it is further noted that an MPEG like video signal compression system inherently has computer programmable instructions to execute the compression/decompression processes, see flowcharts in figures 5-7).

6.   Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savatier

(US 5,400,075) in view of Moroney et al. (US 5,771,239).

        Re claims 9 and 10, Savatier does not particularly teach applying a grammar based code

and a YK algorithm as claimed.

        However, Moroney teaches the MPEG coding technique uses a formal grammar

("syntax") and a set of semantic rules for the construction of bitstreams to be transmitted,

wherein the grammar encoding would obviously have YK algorithm to encode the homogeneous

files.

        Therefore, taking the combined teachings of Moroney and Savatier as a whole, it would

have been obvious to one of ordinary skill in the art to incorporate the teachings of Moroney into

the method of Savatier to improve coding efficiency.

        Re claims 16/9 and 16/10, Savatier further discloses a computer-readable medium

bearing Instructions for compressing video, said instructions being arranged, upon execution by

one or more processors, to perform .the steps of the methods (fig. 1, col. 4, lines 3-8; note the

VLC is a memory programmed at respective address locations with variable length codewords

corresponding to the address values, this indicates the VLC is programmable to encode the video

data, it is further noted that an MPEG like video signal compression system inherently has

computer programmable instructions to execute the compression/decompression processes, see

flowcharts in figures 5-7).

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

Liu et al. (US 6,731,685) discloses a method and apparatus for determining a bit rate need parameter in a statistical multiplexer.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung Vo whose telephone number is 571-272-7340. The examiner can normally be reached on Monday-Wednesday, Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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